In the Claims:

Please amend claims 1, 36, 37, 63-68, and 72 under the provisions of 37 C.F.R. §1.121(c) as follows:

--1. (AMENDED) A method of identifying a compound having a selected property of interest in a library of compounds, each of said compounds being bound to its respective solid support, and being produced by a unique reaction series composed of N reaction steps, wherein each compound is prepared from a component, and N is an integer from at least 1 to about 100, which comprises:

a) dividing a population of solid supports having at least one type of a [first] functional group at the surface of said solid support selected from the group consisting of CO_2H, OH, SH, NH_2, NHR, CH_2Cl, CH_2Br and CHN_2, wherein R is a linear C_1-C_9 alkyl group, into M batches, wherein M is an integer from at least 2 to about 25;

b) coupling the M batches of solid support in a set of at least one reaction respectively with M different components so as to form a bond with the solid support via said [first] functional group, said components being independently protected or unprotected;

c) adding to each batch, either prior to coupling step b), concurrently therewith, or subsequently to step b), from about 0.001 to about 0.5 molar equivalent of a spectrally distinguishable fluorophore tag associated uniquely with each component, said tag being identified by its characteristic excitation wavelength(s), emission wavelength(s), excited state lifetime and emission intensity, said tag being [activated so as to be] capable of forming [either] a [direct] bond to [the surface of] the solid support[, either via the first or a second functional group which is protected or unprotected and is the same as] or [different from the first functional group bonded] to the component[, or an indirect bond via a C_1-C_9 linear or branched alkyl linker moiety which is either interrupted or uninterrupted by at least one oxygen or nitrogen atom or a carbonyl, (C=O)NH or NH(C=O) moiety, wherein when said second functional group is protected, said functional group is deprotected prior to forming said direct or indirect bond, said linker

being bonded to the second functional group at the surface of the solid support]; and either

d) recombining all *M* batches, said recombining step being either prior to or subsequent to step e), and steps e) - g); or

e) performing an assay capable of indicating that any compound in the library either while bound to or cleaved from its solid support has the property of interest;

f) collecting spectral fluorescence data for each respective solid support so as to determine respective relative abundances of the fluorophore tags bound thereto; and

g) analyzing the collected spectral fluorescence data by comparing the respective relative abundances of the fluorophore tags determined in step f) so as to determine the unique reaction series for the compound, thereby identifying the compound having the property of interest.--

--36. (AMENDED) An apparatus for identifying a compound having a selected property of interest in a library of compounds, each of said compounds being bound to its respective solid support, and being produced by a unique reaction series composed of *N* reaction steps, wherein each said compound is prepared from a component, and *N* is an integer from at least 1 to about 100, said solid support being at least one particle array, said apparatus comprising:

a) an electrode and an electrolyte solution having an interface therebetween,

b) an electric field generator which generates an electric field at an interface between an electrode and an electrolyte solution;

c) said electrode being patterned to modify the electrochemical properties of said electrode;

d) an illuminating source which illuminates said interface with a predetermined light pattern to control the movement of said particles in accordance with said predetermined light pattern and the electrochemical properties of said electrode;

e) means for preparing said chemical library, which comprises:

i) means for dividing a population of solid supports having at least one type of a [first] functional group at the surface of said solid support selected from the group consisting of CO_2H, OH, SH, NH_2, NHR, CH_2Cl, CH_2Br and CHN_2, wherein R is a linear C_1-C_9 alkyl group, into *M* batches, wherein *M* is an integer from at least 2 to about 25;

ii) means for coupling the *M* batches of solid support in a set of at least one reaction respectively with *M* different components so as to form a bond with the solid support via said [first] functional group, said components being independently protected or unprotected;

iii) means for adding to each batch either prior to coupling step ii), concurrently therewith, or subsequently to step ii), from about 0.001 to about 0.5 molar equivalent of a spectrally distinguishable fluorophore tag associated uniquely with each component, said tag being identified by its characteristic excitation wavelength(s), emission wavelength(s), excited state lifetime and emission intensity, said tag being [activated so as to be] capable of forming either a [direct] bond to [the surface of] the solid support[, either via the first or a second functional group which is protected or unprotected and is the same as or different from said first functional group, a direct bond] or to the component which if protected is priorly deprotected[, or an indirect bond via a C_1,-C_9, linear or branched alkyl linker moiety which is either interrupted or uninterrupted by at least one oxygen or nitrogen atom or a carbonyl, (C=O)NH or NH(C=O) moiety, wherein when said second functional group is protected, said second functional group is deprotected prior to forming said direct or indirect bond, said linker being bonded to said second functional group at the surface of the solid support]; and either

iv) means for recombining all *M* batches, said recombining step either being prior to or subsequent to step v), and steps v)-vii); or;

v) means for performing an assay capable of indicating that any compound in the library either while bound to or cleaved from its solid support has the property of interest;

vi) means for collecting spectral fluorescence data for each respective solid support so as to determine respective relative abundances of the fluorophore tags bound thereto;

vii) means for analyzing the collected spectral fluorescence data by comparing the respective relative abundances of the fluorophore tags determined in step vi) so as to determine the unique reaction series for the compound, thereby identifying the compound having the property of interest.--

--37. (AMENDED) A method of identifying a compound having a selected property of interest in a library of compounds, each of said compounds being bound to its respective solid support, and being produced by a unique reaction series composed of *N* coupling or reaction steps, wherein each compound is prepared from components which are independently the same or different, and *N* is an integer from at least 1 to about 100, which comprises:

a) dividing a population of solid supports having at least one type of a [first] functional group at the surface of said solid support surface selected from the group consisting of CO_2H, OH, SH, NH_2, NHR, CH_2Cl, CH_2Br and CHN_2, wherein R is a linear C_1-C_6 alkyl group, into *M* batches, wherein *M* is an integer from at least 2 to about 50;

b) coupling the *M* batches of solid support in a set of at least one reaction respectively with *M* different initial components so as to form a bond with the solid support via said [first] functional group, said components being protected or unprotected at a group which is capable of participating in a further coupling step and orthogonally protected at non-participating group(s);

c) adding to each batch either prior to coupling step b), concurrently therewith, or subsequently to step b), from about 0.001 to about 0.5 molar equivalent of a spectrally

distinguishable fluorophore tag associated uniquely with each initial component or a reaction of step b), said tag being identified by its characteristic excitation wavelength(s), emission wavelength(s), excited state lifetime and emission intensity, said tag being [activated so as to be] capable of forming [either] a [direct] bond to [the surface of] the solid support[, either via the first or a second functional group which is protected or unprotected and is the same as or different from said first functional group, a direct bond] or to the initial component [which if protected is priorly deprotected, or an indirect bond via a C_1-C_9 linear or branched alkyl linker moiety which is interrupted or uninterrupted by either at least one oxygen or nitrogen atom or a carbonyl, (C=O)NH or NH(C=O) moiety, said linker being bonded to said first functional group at the surface of the solid support, wherein when said second functional group is protected, said second functional group is deprotected prior to forming said direct or indirect bond]; and either

d) recombining all *M* batches and cleaving any protecting group present at a group which is to participate in a further coupling step, said recombining step being either prior to or subsequent to step e), and steps e)-h); or

e) iteratively *N* - 1 times

(1) dividing a population of solid supports into *M(N)* batches, wherein *M(N)* depends on *N* and is an integer from at least 2 to about 25;

(2) coupling the *M(N)* batches of solid support respectively with *M(N)* different components, wherein *M(N)* is the number of batches during the *N*th step, said components being protected or not protected at a group which is capable of participating in a further coupling step and orthogonally protected at a nonparticipating group(s);

(3) adding to each batch either prior to coupling step (2), concurrently therewith, or subsequently to step (2), from about 0.001 to about 0.5 molar equivalent of a spectrally distinguishable fluorophore tag associated uniquely with each component in the *N*th coupling step (2), said tag being identified by its characteristic excitation wavelength(s), emission wavelength(s), excited state

lifetime and emission intensity, said tag being [activated so as to form either] capable of forming a [direct] bond to [the surface of] the solid support[, either via a functional group which is protected or not protected and is the same as or different from the functional group bonded to the component, a direct bond] or to the (*N* - *1*)th component[, or an indirect bond via a C_1 -C_9 linear or branched alkyl linker moiety which is optionally interrupted by at least one oxygen or nitrogen atom or a carbonyl, (C=O)NH or NH(C=O) moiety, said linker being bonded to the functional group at the surface of the solid support, wherein when said functional group is protected, said function group is deprotected prior to forming said direct or indirect bond]; and

(4) recombining all *M(N)* batches and cleaving any protecting group present at a group which is to participate in a further coupling step;

so as to form a compound having *N* components;

f) performing an assay capable of indicating that any compound in the library either while bound to or cleaved from its solid support has the property of interest;

g) collecting spectral fluorescence data for each respective solid support so as to determine respective relative abundances of the fluorophore tags bound thereto; and

h) analyzing the collected spectral fluorescence data by comparing the respective relative abundances of the fluorophore tags determined in step g) so as to determine the *N* components coupled in the unique reaction series for the compound, thereby identifying the compound having the property of interest.--

--63. (AMENDED) The method of claim 62 wherein the dynamic planar array of beads is formed [adjacent to the planar walls of a sandwich flow cell and controlled by light-controlled electrokinetic means] by using an apparatus capable of dynamically assembling an array of beads at an interface between an electrode and an electrolyte solution, said apparatus comprising:

i) an electrode, an electrolyte solution and an interface therebetween;

ii) a plurality of beads located in said electrolyte solution;

iii) said electrode being patterned to include at least one area of modified electrochemical properties; and

iv) an electric field generator which generates an electric field at said interface to cause the assembly of an array of beads in accordance with the electrochemical properties of said electrode.--

--64. (AMENDED) The method of claim 62 wherein the dynamic planar array of beads is formed by using an apparatus capable of dynamically assembling [and disassembling] an array of beads at an interface between an electrode and an electrolyte solution, said apparatus comprising:

i) an electrode, an electrolyte solution and an interface therebetween;

ii) a plurality of beads located in said electrolyte solution;

iii) [said electrode being patterned to include at least one area of modified electrochemical properties;

iv)] an illumination source which illuminates said electrode with a predetermined light pattern; and

[v)] iv) an electric field generator which generates an electric field at said interface to cause the assembly of an array of beads in accordance with the predetermined light pattern.--

--65. (AMENDED) The method of claim 62 wherein spectral fluorescence data are collected for the bead array by initially forming a spatially encoded array of beads suspended at an interface between an electrode and an electrolyte solution, comprising the following steps:

i) providing an electrode and an electrolyte solution;

ii) providing multiple types of particles, each type [being stored in accordance with] having chemically or physically distinguishable [particle] characteristics and placing said particles in one [of a plurality of] or more

reservoirs, each reservoir containing [a plurality of like-type] one or more types of said particles suspended in said electrolyte solution;

iii) [providing said reservoirs in the form of an *mxn* grid arrangement] modifying said electrode to define one or more compartments corresponding to one or more of said reservoirs;

iv) [patterning said electrode to define *mxn* compartments corresponding to said *mxn* grid of reservoirs;

v)] depositing [*mxn* droplets] one aliquot from [said *mxn*] one or more of said one or more reservoirs onto said [corresponding *mxn* compartments] modified electrode surface, each said [droplet] aliquot uniquely originating from one of said reservoirs and remaining confined to one of said [*mxn*] one or more compartments and each said [droplet] aliquot containing at least one particle;

[vi)] v) positioning a top electrode above said aliquots so as to simultaneously contact each said [droplet] aliquot;

[vii)] vi) generating an electric field between said top electrode and said [*mxn* droplets] one or more aliquots; and

[viii)] vii) using said electric field to form a bead array in each of said [*mxn*] one or more compartments, each said bead array remaining spatially confined to one of said [*mxn* droplets] one or more aliquots[;

ix) illuminating said *mxn* compartments on said patterned electrode with a predetermined light pattern to maintain the position of said bead arrays in accordance with said predetermined light pattern and the pattern of *mxn* compartments; and

x) positioning said top electrode closer to said electrode thereby fusing said *mxn* droplets into a continuous liquid phase, while maintaining each of said *mxn* bead arrays in one of the corresponding mxn compartments].--

--66. (AMENDED) The method of claim [65] 62 wherein [said compartments are hydrophilic and the remainder of said electrode surface is hydrophobic] spectral

fluorescence data are collected for the bead array by initially forming a spatially encoded array of beads suspended at an interface between an electrode and an electrolyte solution, comprising the following steps:

i) providing an electrode and an electrolyte solution;

ii) providing multiple types of particles, each type having chemically or physically distinguishable characteristics and placing said particles in one or more reservoirs, each reservoir containing one or more types of said particles suspended in said electrolyte solution;

iii) modifying said electrode to define one or more compartments corresponding to one or more said reservoirs;

iv) depositing one aliquot from said one or more reservoirs onto said modified electrode surface, each said aliquot uniquely originating from one of said reservoirs and remaining confined to one of said one or more compartments and each said aliquot containing at least one particle;

v) positioning a top electrode above said aliquots so as to simultaneously contact each said aliquot;

vi) generating an electric field between said top electrode and said one or more aliquots;

vii) using said electric field to form a bead array in each of said one or more compartments, each said bead array remaining spatially confined to one of said one or more aliquots;

viii) positioning said top electrode closer to said electrode thereby fusing said one or more aliquots into a continuous liquid phase, while maintaining each of said one or more bead arrays in one of the corresponding one or more compartments; and

ix) illuminating said one or more compartments on said patterned electrode with a predetermined sequence of one or more light pattern to place said particle arrays into positions on said electrode surface in accordance with said predetermined sequence of light patterns.--

--67. (AMENDED) [The method of claim 37 wherein *N* is an integer from at least 3 to about 12] A planar array encoded in accord with claim 62.--

--68. (AMENDED) [The method of claim 37 wherein *M* and *M(N)* are independently an integer from at least 4 to about 12] A planar array encoded in accord with claim 63, 64, 65 or 66.--

--72. (AMENDED) An apparatus for identifying a compound having a selected property of interest in a library of compounds, each of said compounds being bound to its respective solid support, and being produced by a unique reaction series composed of *N* coupling and reaction steps, wherein each said compound is prepared from a set of components which are independently the same or different, and N is an integer from at least 1 to about 100, said solid support being at least one particle array, said apparatus comprising:

a) an electrode and an electrolyte solution having an interface therebetween;

b) an electric field generator which generates an electric field at an interface between an electrode and an electrolyte solution;

c) said electrode being patterned to modify the electrochemical properties of said electrode;

d) an illuminating source which illuminates said interface with a predetermined light pattern to control the movement of said particles in accordance with said predetermined light pattern and the electrochemical properties of said electrode;

e) means for preparing said chemical library, which comprises:

i) means for dividing a population of solid supports having at least one type of a [first] functional group at the surface of said solid support selected from the group consisting of CO_2H, OH, SH, NH_2,

NHR, CH_2Cl, CH_2Br and CHN_2, wherein R is a linear C_1-C_9 alkyl group, into *M* batches, wherein *M* is an integer from at least 2 to about 50;

ii) means for coupling the *M* batches of solid support in a set of at least one reaction respectively with M different initial components so as to form a bond with the solid support via said [first] functional group, said components being protected or unprotected at a group which is to participate in a further coupling step and orthogonally protected at non-participating group(s);

iii) means for adding to each batch either prior to coupling step ii), concurrently therewith, or subsequently to step ii), from about 0.001 to about 0.5 molar equivalent of a spectrally distinguishable fluorophore tag associated uniquely with each initial component, said tag being identified by its characteristic excitation wavelength(s), emission wavelength(s), excited state lifetime and emission intensity, said tag being [activated so as to be] capable of forming [either] a [direct] bond to [the surface of] the solid support[, either via the first or a second functional group which is protected or unprotected and is the same as] or [different from said first functional group bonded] to the component[, or an indirect bond via a C_1-C_9, linear or branched alkyl linker moiety which is either interrupted or uninterrupted by either at least one oxygen or nitrogen atom or a carbonyl, (C=O)NH or NH(C=O) moiety, said linker being bonded to said second functional group at the surface of the solid support, wherein when said second functional group is protected, said second functional group is deprotected prior to forming said direct or indirect bond]; and either

iv) means for recombining all *M* batches and cleaving any protecting group present at a group which is to participate in a further coupling step, and steps v)-viii); or

v) means for iteratively *N - 1* times

(1) dividing a population of solid supports into *M(N)* batches, wherein *M(N)* depends on *N* and is an integer from at least 2 to about 25;

(2) coupling the *M(N)* batches of solid supports respectively with *M(N)* different components, wherein *M(N)* is the number of batches during the *N*th step, said components being protected or unprotected at a group which is capable of participating in a further coupling step and orthogonally protected at a non-participating group(s);

(3) adding to each batch either prior to coupling step (2), concurrently therewith, or subsequently to step (2), from about 0.001 to about 0.1 molar equivalent of a different spectrally distinguishable fluorophore tag associated uniquely with each component during the *N*th coupling step (2), said tag being uniquely identified by its excitation wavelength, emission wavelength, excited-state lifetime or emission intensity, whereby said tag is [activated so as to be] capable of forming [either] a [direct] bond to the solid support[, either via an *N*th functional group which is protected or unprotected and is the same as or different from the first functional group, or an indirect bond thereto via a C_1-C_9 linear or branched alkyl linker moiety which is either interrupted or uninterrupted by either at least one oxygen or nitrogen atom or a carbonyl or NH(C=O) moiety,] or [a direct bond] to the *(N-1)*th component which if protected is priorly deprotected[, said tag or linker being bound via the group which is to participate in a further coupling step, wherein when said *N*th functional group is protected, said *N*th functional group is deprotected prior to forming said direct or indirect bond]; and

(4) recombining all *M(N)* batches and cleaving the protecting group present if present at a group which is to participate in a further coupling step;

so as to form a compound having *N* components;

vi) means for performing an assay capable of indicating that any compound in the library either while bound to or cleaved from its solid support has the property of interest;

vii) means for collecting spectral fluorescence data for each respective solid support so as to determine respective relative abundances of the fluorophore tags bound thereto;

viii) means for analyzing the collected spectral fluorescence data by comparing the respective relative abundances of the fluorophore tags determined in step vii) so as to determine the *N* components coupled in the unique reaction series for the compound, thereby identifying the compound having the selected property of interest.--

Please add new claim 73 as follows:

--73. (NEW) An apparatus for identifying a compound having a selected property of interest in a library of compounds, each of said compounds being bound to its respective solid support, and being produced by a unique reaction series composed of *N* coupling and reaction steps, wherein each said compound is prepared from a set of components which are independently the same or different, and *N* is an integer from at least 1 to about 100, said solid support being at least one particle array, said apparatus comprising at least one particle array prepared in accordance with claim 62, and further comprising means for preparing said chemical library, which comprises:

i) means for dividing a population of solid supports having at least one type of a functional group at the surface of said solid

support selected from the group consisting of CO_2H, OH, SH, NH_2, NHR, CH_2Cl, CH_2Br and CHN_2, wherein R is a linear C_1-C_9 alkyl group, into *M* batches, wherein *M* is an integer from at least 2 to about 50;

ii) means for coupling the *M* batches of solid support in a set of at least one reaction respectively with *M* different initial components so as to form a bond with the solid support via said functional group, said components being protected or unprotected at a group which is to participate in a further coupling step and orthogonally protected at non-participating group(s);

iii) means for adding to each batch either prior to coupling step ii), concurrently therewith, or subsequently to step ii), from about 0.001 to about 0.5 molar equivalent of a spectrally distinguishable fluorophore tag associated uniquely with each initial component, said tag being identified by its characteristic excitation wavelength(s), emission wavelength(s), excited state lifetime and emission intensity, said tag being capable of forming a bond to the solid support or to the component; and either

iv) means for recombining all *M* batches and cleaving any protecting group present at a group which is to participate in a further coupling step, and steps v)-viii); or

v) means for iteratively *N - 1* times

(1) dividing a population of solid supports into *M(N)* batches, wherein *M(N)* depends on *N* and is an integer from at least 2 to about 25;

(2) coupling the *M(N)* batches of solid supports respectively with *M(N)* different components, wherein *M(N)* is the number of batches during the *N*th step, said components being protected or unprotected at a group which is capable of participating in a further coupling step and orthogonally protected at a non-participating group(s);

(3) adding to each batch either prior to coupling step (2), concurrently therewith, or subsequently to step (2), from about 0.001 to about 0.1 molar equivalent of a different spectrally distinguishable fluorophore tag associated uniquely with each component during the *N*th coupling step (2), said tag being uniquely identified by its excitation wavelength, emission wavelength, excited-state lifetime or emission intensity, whereby said tag is capable of forming a bond to the solid support or to the *(N-1)*th component which if protected is priorly deprotected; and

(4) recombining all *M(N)* batches and cleaving the protecting group present if present at a group which is to participate in a further coupling step;

so as to form a compound having *N* components;

vi) means for performing an assay capable of indicating that any compound in the library either while bound to or cleaved from its solid support has the property of interest;

vii) means for collecting spectral fluorescence data for each respective solid support so as to determine respective relative abundances of the fluorophore tags bound thereto;

viii) means for analyzing the collected spectral fluorescence data by comparing the respective relative abundances of the fluorophore tags determined in step vii) so as to determine the *N* components coupled in the unique reaction series for the compound, thereby identifying the compound having the selected property of interest.-

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